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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

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February 9, 1995

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Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

Re: Amendment of Parts 2, 21 and 94 of the
Communication's Rules Concerning
Channel Assignments in the 27.5-29.5 GHz
Band. Joint Petition for Rulemaking

Dear Mr. Caton:

On behalf of the Harris Corporation-Farion Division and the Digital Microwave Corporation, we are filing their Joint Petition for Rulemaking, referenced above. An original and fourteen (14) copies are provided. Since the petition is related to the rulemaking proceeding in CC Docket 92-297, we are providing two extra copies to be associated with the Commission's files in that proceeding.

If additional information is needed, the Commission's staff is requested to communicate with us.

Very truly yours,

FLETCHER, HEALD & HILDRETH, P.L.C.

Leonard R. Raish

Leonard R. Raish
Counsel for Harris Corporation-Farion Division
Digital Microwave Corporation

LRR:cej
Enclosures

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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

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FEB 9 1995

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)

)
)
Amendment of Parts 2, 21 and 94)
of the Commission's Rules)
Concerning Channel Assignments)
in the 27.5-29.5 GHz Band)

RM - _____

To: The Commission

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**JOINT PETITION FOR RULEMAKING
BY HARRIS CORPORATION-FARINON DIVISION AND
DIGITAL MICROWAVE CORPORATION
PETITION FOR RULEMAKING**

The Harris Corporation -- Farinon Division ("Harris") and the Digital Microwave Corporation ("DMC")(collectively "Harris/DMC") by their attorneys, hereby petition the Commission, pursuant to Section 1.401 of the Commission's Rules, to amend Parts 2, 21 and 94 of the Rules to adopt a channelization plan for the 27.50-29.50 GHz band (the "28 GHz band") and to make that band available for assignment under Part 94 in addition to Part 21.¹ In support whereof, the following is shown.

I. INTRODUCTION

Harris is a Florida corporation with its headquarters located in Melbourne, Florida. Through its Farinon Division, located in San Carlos, California, Harris designs, develops and manufactures

¹The Commission has proposed in WT Docket 94-148 to merge Part 94 and most of Part 21 into a new rule Part, Part 101. If the Commission adopts proposed Part 101, the 28 GHz band should be incorporated into Subparts H and J of the new Part.

microwave and multiplex systems used by licensees in the terrestrial fixed microwave service.

DMC is a California corporation with its headquarters in San Jose, California. DMC designs, develops, and manufactures digital microwave radio equipment likewise used in the terrestrial fixed microwave service.

Both Harris and DMC are among the largest suppliers of microwave equipments in the global market. As leading manufacturers of equipment used in the terrestrial fixed services, Harris/DMC are interested in advancing the state-of-the-art in microwave technology and in maximization of use of those frequency bands available for the terrestrial fixed microwave services.

II. BACKGROUND

On April 19, 1991, Harris petitioned the Commission to adopt a channelization plan for the "28 GHz" band and to make that band available for assignment under Part 94 in addition to Part 21 of its Rules. The Harris petition was designated RM-7722. On June 17, 1991, DMC filed comments in support of the Harris petition.

On January 8, 1993, the Commission released a Notice of Proposed Rulemaking, Order, Tentative Decision and Order on Reconsideration in CC Docket 92-297. Consideration of RM-7722 was included in that Notice. The Notice tentatively concluded "that the 28 GHz band should be redesignated to accommodate multipoint technology" and proposed Rules "designed to foster the provision of innovative services."

On February 11, 1994, the Commission released its Second Notice of Proposed Rulemaking in CC Docket No. 92-297 that led to the establishment of the LMDS/FSS 28 GHz Band Negotiated Rulemaking Committee in July 1994. The Committee issued its Report to the Commission on September 23, 1994. A representative of both Harris and DMC was on the Negotiated Rulemaking

Committee to speak for the terrestrial fixed microwave interests. The aforementioned September 23, Report includes in its Addenda two statements by Harris/DMC that inter alia addresses the subject of the "traditional" terrestrial microwave service in the 27.5-29.5 GHz bands. These statements were submitted because the Negotiated Rulemaking Committee addressed only the sharing of the 27.5-29.5 GHz band by the LMDS and FSS and had no time left to discuss the details of an eventual FSS/microwave sharing of the band.

III. ORIGINAL HARRIS PETITION HAS BEEN OVERTAKEN BY EVENTS

The April 19, 1991 Harris petition is technically still pending as the above referenced Commission action dated January 8, 1993 was tentative. However, over the ensuing nearly four years the future of the 27.5-29.5 GHz has been debated extensively. Harris/DMC therefore submits this new Petition for Rulemaking that is based on the current fact situation. Upon acceptance of this petition by the Commission, the April 19, 1991 can be regarded as withdrawn.

IV. STILL NEED FOR CHANNELLING 27.5-29.5 GHZ BAND TO ALLOW FOR "TRADITIONAL" FIXED MICROWAVE

In its April 1991 petition, Harris specifically stated that, in the absence of a channelization plan, it was difficult for the US manufacturers to design and put equipment on the market because of the uncertainty as to channel pairings, bandwidths, channel spacings, etc. Had the Harris and DMC petitions been granted in 1991, the United States would likely have become the first supplier of 28 GHz radio-relay equipment in the world. This would have secured the international leadership which is still held today by the US for the procurement of state-of-the-art point-to-point microwave radios in very high frequency bands (in the 18 to 60 GHz range). Several US based companies including Harris-Farion and Digital Microwave Corporation are presently active in successfully

exporting high value/high technology point-to-point high frequency radio products.

Lately and as a direct consequence of WARC-92, the 28 GHz band has been gathering even more interest in Europe. Indeed, WARC-92 reduced the size of the 23 GHz microwave allocation when it granted the band 21.4-22 GHz for wideband HDTV applications in ITU region 1 (Europe/Africa) and region 3 (Asia/Australasia). Although the effective use of 28 GHz may be limited by the heavy rains situations encountered in certain Asians or African countries, such is not the case in Europe or in North America. In the United States, the 28 GHz is increasingly perceived as a key "traditional" microwave point-to-point band with its central position in the 23 to 38 GHz wide "microwave spectrum desert" and the increasing pressures on the 23 and 38 GHz bands.²

At this point, Harris/DMC strongly reiterate the need for a channelization of the 27.5-29.5 GHz band in order to allow for point-to-point microwave use of the band and give the green light to the design of products that have high export potential. A healthy domestic market base would be highly beneficial in ensuring the continued success of US based microwave suppliers in the export markets. Now is the time to capitalize on recent US advances in MMIC and Gas-FET 28 GHz technologies and consolidate our world leading position in high frequency radio-relay systems procurement. Besides and with the increasing reduction of radio-relay spectrum below 10 GHz, a 28 GHz allocation is needed for other private and commercial microwave point-to-point applications in the United States.

²Due to anticipated congestion, the Commission recently imposed significant limitations on applications for 38 GHz fixed point-to-point microwave systems in PCS networks. See Common Carrier Bureau Established Policy Governing the Assignment of Frequencies in the 38 GHz Band and Other Bands to Be Used in Conjunction with PCS Support Communications, Public Notice, 75 Rad. Reg. (P&F) 2d 1341 (1994).

V. PROPOSAL

Harris/DMC proposes a channel plan for 27.5-29.5 GHz that incorporates a 1 GHz transmit/receive channel spacing. This spacing is adaptable to both a complete 2000 MHz wide microwave point-to-point allocation or to a reduced 28-28.5 GHz/29.0-29.5 GHz one, as proposed in the September 26, 1994 joint Harris/DMC statement to the 28 GHz Negotiated Rulemaking Committee (see Addenda to the September 23, 1994 Report of the LMDS/FSS 28 GHz Band Negotiated Rulemaking Committee). As mentioned in the recent TIA microwave point-to-point Section response to ET Docket No. 94-124 (Amendment o Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications), a T/R spacing of about that size is also advisable to minimize duplexer and filter rejection design constraints.

We recommend the use of an underlying grid of 2.5 MHz subchannels in compliance to draft ITU-R Recommendation F.748.³ This will ease frequency coordination at channel edges and at geographical boundaries in cases where area based, frequency block licensing is applied.

The proposed homogeneous grid pattern is defined by the relation:

$$f_p = 24248 + 2 + 2.5p \text{ and } 1301 \leq p \leq 2099$$

We proposed that the upper part of the microwave point-to-point allocation be channelized into paired 50 MHz blocks. These blocks would be authorized under the Commission's wide area licensing approach which allows for deployment and operation of several individual links within these blocks, without the cost and time delay of individual licensing and traditional frequency coordination. This is particularly attractive for commercial applications where a multitude of links

³ITU-R Working Party 9B Draft revision of existing recommendation ITU-R F.748-1 Radio-Frequency Channel Arrangements for Radio-Relay System Operating in the 25, 26 and 28 GHz Bands, Document 9/22-E, 21 November 1994.

may be required by a given operator. For reasons mentioned before, wide area licensees will be required to subchannelize their assigned pair of 50 MHz channels based on the underlying grid of 2.5 MHz subchannels.

We also propose that the lower end of the 28 GHz band microwave point-to-point allocation be channelized into 5, 10, 20, 40, 80 and 120 MHz paired channels for which licenses will be granted on a link per link basis. This is required to accommodate the specific needs of private users and prevent inefficient use of the spectrum by operators that cannot justify the need for a multitude of 28 GHz links. A 1bit/s/Hz minimum bit efficiency requirement would be enforced but, 1T1 systems would be allowed in 5 MHz channels, and 12T1 would be allowed in the 20 MHz ones.

VI. SHARING WITH OTHER SERVICES IS FEASIBLE

The 2 GHz or the 1 GHz of spectrum that will be allocated for fixed point-to-point microwave systems will also be used for satellites based wideband distribution services. These fixed satellite services or FSS (such as the ones proposed by Hughes and Teledesic) will likely use millions of individual earth stations throughout the US territory.

Users of these earth stations (American consumers) will typically be different from the industrial users of point-to-point microwave systems. These two kinds of users will normally be physically separated by several hundred feet or more. Nevertheless, some special rules are required to ensure long term compatibility between both services. Minimum required antenna directivity must be defined for both satellite and fixed microwave systems. Elevation angle of point-to-point microwave antennas should be kept below 5 degrees. Other simple rules and possible coordination solutions will be discussed and agreed upon once the status of the 28 GHz band will have been

finalized by the Commission. Experience has repeatedly shown that the fixed point-to-point service can share allocations with the FSS.

VII. OTHER FCC PROCEEDINGS INVOLVED

As indicated in Section VI just above, the eventual status of the 28 GHz band is a factor that will be relevant to this Petition, i.e., the Commission's decision in CC Docket No 92-297 will likely have a bearing as to specific spectrum that will be available. Also the outcome of FCC's proposed rulemaking action in WT Docket No. 94-148 will have a bearing as well. It is assumed that the channelization finally adopted for the 28 GHz band would be incorporated in the new Part 101 governing terrestrial fixed microwave radio services.

VIII. CONCLUSIONS

In conclusion:

- (a) As pointed out in Harris-Farion's original petition filed on April 19, 1991 and reiterated herein above, there is still a need for channelling the 27.5-29.5 GHz band so as to accommodate "traditional" terrestrial fixed microwave;
- (b) Interest in the 28 GHz for terrestrial fixed use is growing, particularly in Europe. Had the Commission granted the Harris petition of 1991, the U.S. would likely have been the first supplier of 28 GHz radio relay equipment.
- (c) Because of reduction of spectrum allocations for radio relay (i.e., terrestrial fixed microwave) below 10 GHz, additional spectrum is needed. Being situated between the "23 GHz" and "38 GHz" bands,

the 27.5-29.5 GHz band is an ideal choice.

- (d) The requirements of other services for spectrum in 27.5-29.5 GHz band and the need for sharing the band is recognized, hence the outcome of the Commission's action in Docket No. 92-297 will be relevant to this Petition.

Considering the premises set forth herein above, the Commission is urged to proceed to rulemaking in this matter to adopt the channelling proposed in Appendix 1.

Respectfully submitted,

HARRIS CORPORATION-FARINON
DIVISION AND DIGITAL MICROWAVE
CORPORATION

By: 
Leonard R. Raish

Their Attorney

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Dated: February 9, 1995

APPENDIX

Parts 2, 21 and 94 of Chapter 1 of Title 47 of the Code of Federal Regulations are amended as follows:

1. 47 C.F.R. § 106 is amended by adding the following to column (6) in the allocations block for the band 27.5-29.5 GHz in the Table of Allocations:

- PRIVATE OPERATIONAL FIXED MICROWAVE (94)

2. 47 C.F.R. § 21.701 is amended by redesignating Subsections (j), (k), and (l) to (k), (l), and (m), respectively, and by adding a new Subsection (j) to read as follows:

(j) 27,500-29,500 MHz

- (1) 120 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27660.0	28660.0
27780.0	28780.0
27900.0*	28900.0*
28020.0*	29020.0*

*Shared on a first come, first serve basis with channels 1A/1B, 2A/2B, 3A/3B and 4A/4B

- (2) 80 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27620.0	28620.0
27700.0	28700.0
27780.0	28780.0
27860.0	28860.0
27940.0*	28940.0*

*Shared on a first come, first serve basis with channels 1A/1B and 2A/2B

- (3) 40 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27600.0	28600.0
27640.0	28640.0

27680.0	28680.0
27720.0	28720.0
27760.0	28760.0
27800.0	28800.0
27840.0	28840.0
27880.0*	28880.0*
27920.0*	28920.0*
27960.0*	28960.0*

*Shared on a first come, first serve basis with channels 1A/1B and 2A/2B

(4) 20 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27510.0	28510.0
27530.0	28530.0
27550.0	28550.0
27570.0	28570.0
27590.0	28590.0
27610.0	28610.0
27630.0	28630.0
27650.0	28650.0
27670.0	28670.0
27690.0	28690.0
27710.0	28710.0
27730.0	28730.0
27750.0	28750.0
27770.0	28770.0
27790.0	28790.0
27810.0	28810.0
27830.0	28830.0
27850.0	28850.0
27870.0	27870.0
27890.0	28890.0

(5) 10 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27505.0	28505.0
27515.0	28515.0
27525.0	28525.0
27535.0	28535.0

27545.0	28545.0
27555.0	28555.0
27565.0	28565.0
27575.0	28575.0
27585.0	28585.0
27595.0	28595.0
27605.0	28605.0
27615.0	28615.0
27625.0	28625.0
27635.0	28635.0
27645.0	28645.0
27655.0	28655.0
27665.0	28665.0
27675.0	28675.0
27685.0	28685.0
27695.0	28695.0
27705.0	28705.0
27715.0	28715.0
27725.0	28725.0
27735.0	28735.0
27745.0	28745.0
27755.0	28755.0
27765.0	28765.0
27775.0	28775.0

(6) 5 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27502.5	28502.5
27507.5	28507.5
27512.5	28512.5
27517.5	28517.5
27522.5	28522.5
27527.5	28527.5
27532.5	28532.5
27537.5	28537.5
27542.5	28542.5
27547.5	28547.5
27552.5	28552.5
27557.5	28557.5
27562.5	28562.5
27567.5	28567.5
27572.5	28572.5

27577.5	28577.5
27582.5	28582.5
27587.5	28587.5
27592.5	28592.5
27597.5	28597.5
27602.5	28602.5
27607.5	28607.5
27612.5	28612.5
27617.5	28617.5
27622.5	28622.5
27627.5	28627.5
27632.5	28632.5
27637.5	28637.5
27642.5	28642.5
27647.5	28647.5
27652.5	28652.5
27657.5	28657.5
27662.5	28662.5
27667.5	28667.5
27672.5	28672.5
27677.5	28677.5
27682.5	28682.5
27687.5	28687.5
27692.5	28692.5
27697.5	28697.5
27702.5	28702.5
27707.5	28707.5
27712.5	28712.5
27717.5	28717.5
27722.5	28722.5
27727.5	28727.5
27732.5	28732.5
27737.5	28737.5
27742.5	28742.5
27747.5	28747.5
27752.5	28752.5
27757.5	28757.5
27762.5	28762.5
27767.5	28767.5
27772.5	28772.5
27777.5	28777.5

(7) 50 MHz paired frequency blocks subject to wide area licensing procedures, 1000 MHz separation:

Channel Group A		Channel Group B	
Channel No.	Frequency band limits (MHz)	Channel No.	Frequency band limits (MHz)
1A	27900-27950*	1B	28900-28950*
2A	27950-28000*	2B	28950-29000*
3A	28000-28050**	3B	29000-29050**
4A	28050-28100**	4B	29050-29100**
5A	28100-28150	5B	29100-29150
6A	28150-28200	6B	29150-29200
7A	28200-28250	7B	29200-29250
8A	28250-28300	8B	29250-29300
9A	28300-28350	9B	29300-29350
10A	28350-28400	10B	29350-29400
11A	28400-28450	11B	29400-29450
12A	28450-28500	12B	29450-29500

*Shared on a first come, first serve basis with the 40, 80, and 120 MHz channels

**Shared on a first come, first serve basis with 120 MHz channels

3. The table in 47 C.F.R. § 94.61(b) is amended by adding the band 27,500-29,500 MHz following the entry for "22,200 to 23,600" and by adding note 35 to read as follows:

35. Frequencies in this band are shared with the Fixed Satellite Service (Part 25) and by the Point-to-Point Microwave Service (Part 21).

4. 47 C.F.R. § 94.65 is amended by re-designating Subsections (n), (o), (p), (q) and (r) to (p), (q), (r) and (s), respectively, and by adding a new Subsection (n) to read as follows:

n. 27,500-29,500 MHz

(1) 120 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)

Receive (Transmit) (MHz)

27660.0
27780.0
27900.0*

28660.0
28780.0
28900.0*

28020.0*

29020.0*

*Shared on a first come, first serve basis with channels 1A/1B, 2A/2B, 3A/3B and 4A/4B

(2) 80 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27620.0	28620.0
27700.0	28700.0
27780.0	28780.0
27860.0	28860.0
27940.0*	28940.0*

*Shared on a first come, first serve basis with channels 1A/1B and 2A/2B

(3) 40 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27600.0	28600.0
27640.0	28640.0
27680.0	28680.0
27720.0	28720.0
27760.0	28760.0
27800.0	28800.0
27840.0	28840.0
27880.0*	28880.0*
27920.0*	28920.0*
27960.0*	28960.0*

*Shared on a first come, first serve basis with channels 1A/1B and 2A/2B

(4) 20 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27510.0	28510.0
27530.0	28530.0
27550.0	28550.0
27570.0	28570.0
27590.0	28590.0
27610.0	28610.0
27630.0	28630.0
27650.0	28650.0

27670.0	28670.0
27690.0	28690.0
27710.0	28710.0
27730.0	28730.0
27750.0	28750.0
27770.0	28770.0
27790.0	28790.0
27810.0	28810.0
27830.0	28830.0
27850.0	28850.0
27870.0	27870.0
27890.0	28890.0

(5) 10 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)	Receive (Transmit) (MHz)
27505.0	28505.0
27515.0	28515.0
27525.0	28525.0
27535.0	28535.0
27545.0	28545.0
27555.0	28555.0
27565.0	28565.0
27575.0	28575.0
27585.0	28585.0
27595.0	28595.0
27605.0	28605.0
27615.0	28615.0
27625.0	28625.0
27635.0	28635.0
27645.0	28645.0
27655.0	28655.0
27665.0	28665.0
27675.0	28675.0
27685.0	28685.0
27695.0	28695.0
27705.0	28705.0
27715.0	28715.0
27725.0	28725.0
27735.0	28735.0
27745.0	28745.0
27755.0	28755.0
27765.0	28765.0

27775.0

28775.0

(6) 5 MHz maximum authorized bandwidth channels, 1000 MHz separation:

Transmit (Receive) (MHz)

Receive (Transmit) (MHz)

27502.5	28502.5
27507.5	28507.5
27512.5	28512.5
27517.5	28517.5
27522.5	28522.5
27527.5	28527.5
27532.5	28532.5
27537.5	28537.5
27542.5	28542.5
27547.5	28547.5
27552.5	28552.5
27557.5	28557.5
27562.5	28562.5
27567.5	28567.5
27572.5	28572.5
27577.5	28577.5
27582.5	28582.5
27587.5	28587.5
27592.5	28592.5
27597.5	28597.5
27602.5	28602.5
27607.5	28607.5
27612.5	28612.5
27617.5	28617.5
27622.5	28622.5
27627.5	28627.5
27632.5	28632.5
27637.5	28637.5
27642.5	28642.5
27647.5	28647.5
27652.5	28652.5
27657.5	28657.5
27662.5	28662.5
27667.5	28667.5
27672.5	28672.5
27677.5	28677.5
27682.5	28682.5
27687.5	28687.5

27692.5	28692.5
27697.5	28697.5
27702.5	28702.5
27707.5	28707.5
27712.5	28712.5
27717.5	28717.5
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(7) 50 MHz paired frequency blocks subject to wide area licensing procedures, 1000 MHz separation:

Channel Group A		Channel Group B	
Channel No.	Frequency band limits (MHz)	Channel No.	Frequency band limits (MHz)
1A	27900-27950*	1B	28900-28950*
2A	27950-28000*	2B	28950-29000*
3A	28000-28050**	3B	29000-29050**
4A	28050-28100**	4B	29050-29100**
5A	28100-28150	5B	29100-29150
6A	28150-28200	6B	29150-29200
7A	28200-28250	7B	29200-29250
8A	28250-28300	8B	29250-29300
9A	28300-28350	9B	29300-29350
10A	28350-28400	10B	29350-29400
11A	28400-28450	11B	29400-29450
12A	28450-28500	12B	29450-29500

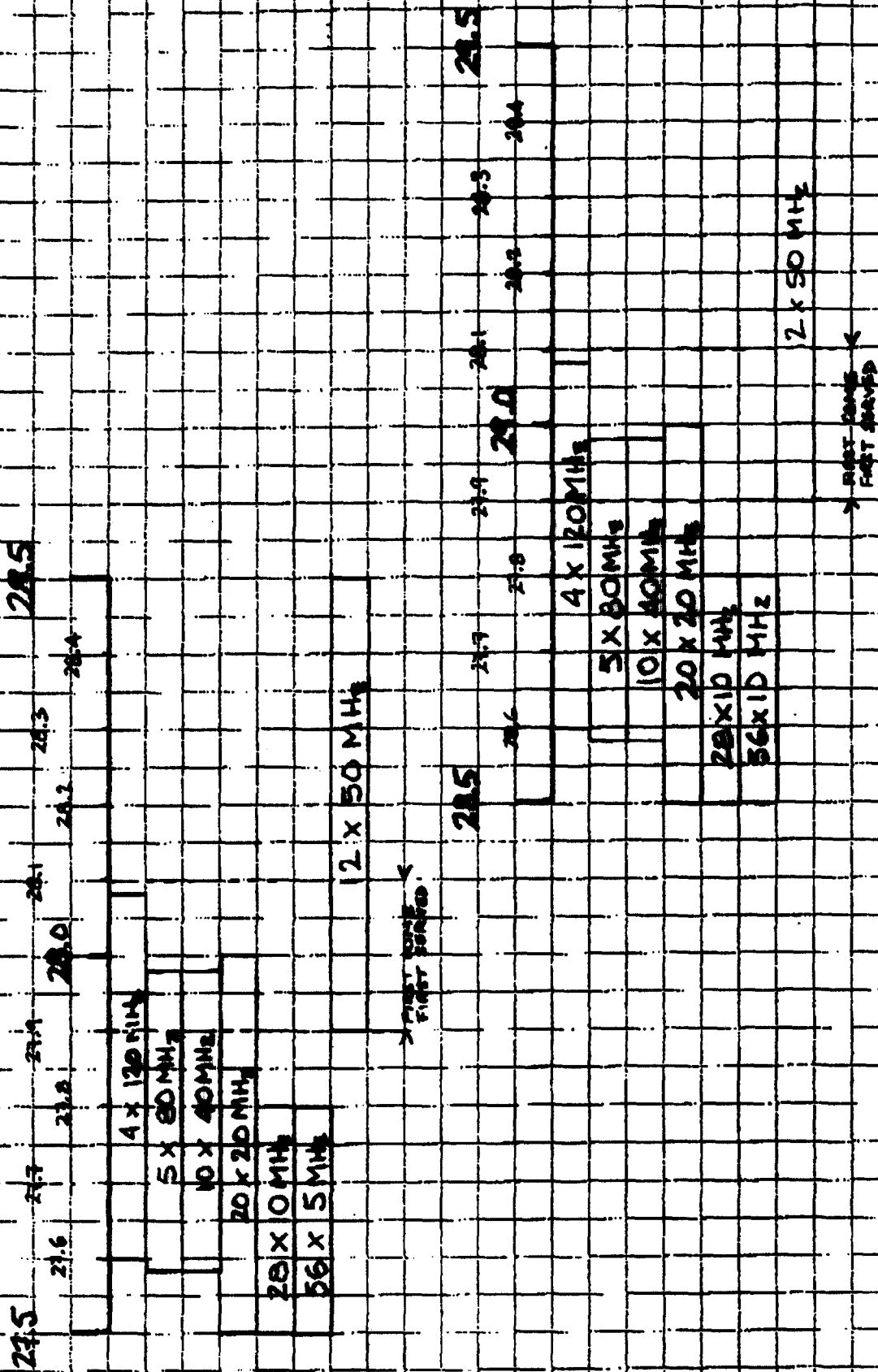
*Shared on a first come, first serve basis with the 40, 80, and 120 MHz channels

**Shared on a first come, first serve basis with 120 MHz channels

ATTACHMENT

**Proposed Channelization of the 27.5-29.5 GHz Band
(As Per Appendix: Assuming a 2000 MHz FSS/Microwave Allocation)**

PROPOSED CHANNELIZATION OF THE 27.5-29.5 GHz BAND (AS PER APPENDIX; ASSUMING A 200 MHz FSF/MICROWAVE ALLOCATION)



CERTIFICATE OF SERVICE

I, Chellestine Johnson, a secretary in the law firm of Fletcher, Heald & Hildreth, P.L.C., do hereby certify that copies of the foregoing "Joint Petition for Rulemaking by Harris Corporation-Farion Division and Digital Microwave Corporation Petition for Rulemaking" were sent this 9th day of February, 1995, by hand delivery and first-class United States mail, postage prepaid, to:

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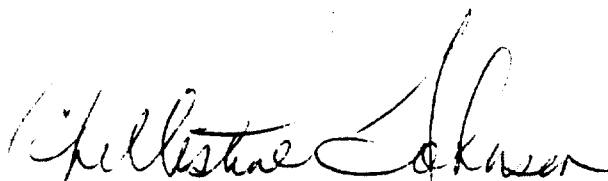
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A handwritten signature in cursive script, appearing to read "Chellestine Johnson", written over a horizontal line.

Chellestine Johnson